

# ELEDONIDS EXPLOITED IN THE THRACIAN SEA : PRELIMINARY ANALYSIS OF STOCK STRUCTURE BASED ON TRAWLERS LANDINGS

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## Abstract

*Eledone moschata* and *Eledone cirrhosa* are by-catches of demersal trawling for fishes in the Thracian Sea. Trawl landings of the two species were recorded for the fishing period October 1998 - May 1999, during which the proportion of *E. moschata* was generally higher. A single cohort, consisted mostly of immature individuals, was present in *E. cirrhosa* landings. In the population of *E. moschata* two peaks of recruitment in October '98 and April '99, were observed. Males have been shown to reach maturity earlier than females in both species.

**Keywords :** Cephalopods, fisheries, Aegean Sea

## Introduction

*Eledone moschata* and *Eledone cirrhosa* are an important component of cephalopod catches in the Thracian Sea (1). This resource is exploited almost exclusively by trawlers and less than 1% of *Eledone moschata* is landed by beach-seiners (2). Both elledonids, are commercialized under the same common name, thus it is impossible to assess catches of each species from official landings.

The monthly contribution of the two species in landings was studied for the first time in the framework of an E.U. funded project on "Analysis and evaluation of the fisheries of the most important cephalopod species in the Mediterranean Sea".

## Materials and methods

Landings of the two species were reported for trawlers on a fortnight basis (the last three days of each fortnight), by an observer at the auction of Kavala. The period June-September is a closed season for trawlers according to the Greek legislation, thus data were collected for the 8month fishing period : October 1998 - May 1999. During this period biological samples of trawlers landings were bought every month. Records of mantle length (in mm), weight (in gr), sex and maturity stage were taken from freshly caught or frozen specimens.

## Results and discussion

*E. moschata* constituted the major part (69-96%) of elledonids landings from November '98 to March '99 and in May '99 (Fig. 1). Experimental trawl surveys carried out in the Thracian Sea (1992-1993) had shown that *E. moschata* and *E. cirrhosa* represented respectively the 14.2% and 26.7% of the cephalopod biomass estimated for the bathymetric zone 10-400m (1). The dominance of *E. moschata* in trawl landings could be related to the small individual weight of immature *E. cirrhosa* during the sampling period, as well as, to the greater concentration of trawlers activity in lower depths near the coasts, especially in winter time, where *E. moschata* is more abundant (1).

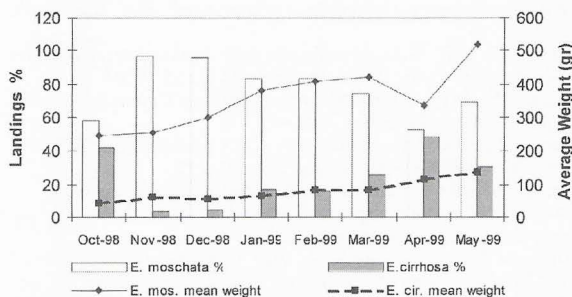


Figure 1. Monthly percentage and mean individual weight of *E. cirrhosa* and *E. moschata* in the Thracian Sea from October 1998 to May 1999.

A single cohort is present in *E. cirrhosa* landings, with a common modal length for both sexes, increasing from 6cm in October to 8cm in May (Fig. 2). The presence of one year class in the catches of *E. cirrhosa* has also been reported for other areas (1,4) and it could be related to the short life span of the species (about 1 year) (4) and the seasonality in the reproductive cycle of the species (5).

Length frequency distributions indicate two peaks of recruitment for *E. moschata*, occurring in October '98 and April '99 (Fig. 2). A wide recruitment period has been shown for *E. moschata* also in the southern Aegean Sea (6).

Sexual maturation follows different time courses for the two sexes in both species. Immature individuals dominate (74% - 100%) in the population of *E. cirrhosa* till March, whereas only males attain maturity within the sampling period. According to previous investigation in the study area, it is assumed that the period of female maturity in the Thracian Sea occurs from early summer till mid of autumn (7).

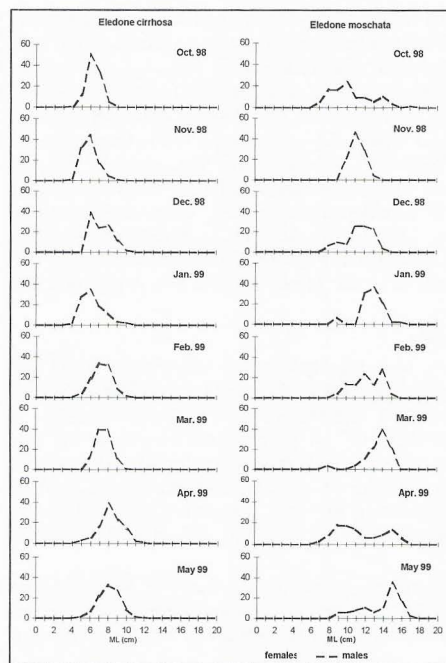


Figure 2. Monthly length-frequency distributions of *E. cirrhosa* and *E. moschata* in the Thracian Sea from October 1998 to May 1999.

Mature females of *E. moschata* (11/98 - 3/99 : 4-14%, 4/99 : 23%, 5/99 : 52%) show an apparent increase from April onwards whereas high percentages of mature males appear from February (69%). The relatively low percentage of mature females (31%) in October indicates that these are probably the last to mature and spawn from a year class which began spawning in early spring. This suggestion is in agreement with the model of the species life cycle proposed by Mangold (8).

## References

- Lefkaditou E. and Papaconstantinou C., 1999. Cephalopod distribution and fisheries in the Thracian Sea. Meeting of the Geotechnical Chamber of Greece - Branch of Thrace on "Fish stock management in the Thracian Sea", May 1999, Proceedings volume : 15-32.
- Lefkaditou E. and Adamidou A., 1997. Beach-seine fishery in the Thracian Sea and its contribution to the exploitation of the demersal species. Proceedings of the 5<sup>th</sup> Symposium of Fishery and Oceanography, Kavala, April 1997, Vol. 2.
- Boyle P. R. and Knobloch D., 1982. On growth of the octopus *Eledone cirrhosa*. *J. mar. biol. Ass. U.K.*, 62 : 277-296.
- Wurtz M., Matricardi G. and Belcari P., 1992. Distribution and abundance of *Eledone cirrhosa* in the Tyrrhenian Sea, Central Mediterranean. *Fisheries Research* 13 : 53-56.
- Boyle P.R., 1983. *Eledone cirrhosa*. In : P.R. Boyle (Ed.) : *Cephalopods Life Cycle. Species Account*, Vol. I : 366-385. Academic Press, London.
- Lefkaditou E., Siapatis A. and Papaconstantinou C., 1998. Seasonal and spatial changes in the abundance and distribution of *Eledone moschata* (Cephalopoda : Octopoda), in the South Aegean Sea (Eastern Mediterranean). *ICES Doc. CM 1998/M : 44* (poster and text) : 8 pp, Lisbon, September 1998.
- Lefkaditou E. and Papaconstantinou C., 1995. Distribution, growth and maturity of *Eledone cirrhosa* (Cephalopoda : Octopoda) in the Thracian Sea (Eastern Mediterranean). *Rapp. Comm. int. Mer Médit.* 34 : 247.
- Mangold K., 1983. *Eledone moschata*. In : P.R. Boyle (Ed.) : *Cephalopods Life Cycle. Species Account*, Vol. I : 387-400. Academic Press, London.